MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 2 2022/2023 (TERM ID 2220)

BBF3124 – FINANCIAL DERIVATIVES

(All Sections/Groups)

11 JULY 2023
9.00 a.m. -11.00 a.m.
(2 Hours)

INSTRUCTIONS TO STUDENT

1. This question paper consists of 5 pages with 4 Questions and 1 Cumulative Normal Distribution Table only.

2. Attempt all **FOUR** questions. The distribution of the marks for each question is given.

3. Please write all your answers in the Answer Booklet provided.

QUESTION 1

(a) Suppose your company has just exported Crude Palm Oil to a European customer. You will receive 20 million Euro as payment in 90 days. Assume that forward, futures, and options on Euro currency were available.

(i) How would your position above be risky? What is your exposure?

(5 marks)

(ii) Explain how you would use the above instruments to manage your exposure.

(12 marks)

(b) As an investment manager, Mr Kai is expected to manage customers' stock portfolios including index arbitrage trading. The following quotes are now available:

KLCI Index	:	1,458 points
3-month SIF	:	1,456 (maturing 30 days)
Risk free rate	:	3.7%
Dividend yield	:	2% (annualized)

(i) Prove that arbitrage is possible.

(5 marks)

(ii) Outline an appropriate strategy.

(3 marks)

(Total: 25 marks)

Continued ...

QUESTION 2

(a) In June 2023, your company would need to borrow a total of RM 300,000,000 for a period of 3 months from beginning September till December to finance a project. Since you expect that the inflation rates will increase, you decide to hedge your position. The current 3-month KLIBOR rate is 3.60% and September KLIBOR futures stands at 96.0. However, by September, the interest rate increases to 3.80 %. It is assumed that convergence will be applied at maturity.

(i) Construct and propose the most appropriate strategy by identifying the number of contracts needed. Evaluate the proposed strategy as well.

(4 marks)

(ii) Determine the September KLIBOR futures quotation.

(2 marks)

(iii) Identify the annualized effective interest rate.

(10 marks)

(b) As market volatility persists due to the banking crisis and uncertainty around interest rates, you wish to reduce your stock portfolio beta from the initial beta of 1.50 to 1.20. You are managing a portfolio with a value of RM 4.5 million and the FBM KLCI is currently at 1450 points. Demonstrate the use of SIF contracts by specifying the number of contracts that could be utilised to achieve the desired outcome.

(5 marks)

(c) There are many benefits of Stock Index Futures (SIF) contract as claimed by Bursa Derivatives. Explain the **TWO (2)** reasons why investors are attracted to Stock Index Futures (SIF) contracts.

(4 marks)

(Total: 25 marks)

QUESTION 3

(a) You, as a fund manager, have recently purchased one million of Public Bank Bhd share at the price of RM 4.00 based on its long-term potentials. However, as the Russia-Ukraine war escalates, your management team intends to keep the share over the longer term and want to profit from long term capital appreciation and not from short term volatility. Assuming the option contract size for one contract is one million shares. Below is the information gathered from derivatives market:

3-month RM 3.00 Public Bank Bhd put option @ RM 0.20

3-month RM 4.00 Public Bank Bhd put option @ RM 0.30

3-month RM 5.00 Public Bank Bhd put option @ RM 0.40

(i) Propose the most appropriate strategy for the management team with payoff table and payoff graph by indicating the breakeven price and the limited loss with the price range from RM 3.00 to RM 6.00 with interval of RM 1.

(23 marks)

(ii) If the price of Public Bank Bhd at the expiry is expected to be RM 6.00, compute the potential net profit for the strategy taken.

(2 marks)

(Total: 25 marks)

QUESTION 4

(a) IHH Healthcare Bhd is now trading at RM 5.80 per share and 3-month call exercise price is at RM5.60. The risk-free rate is expected at 3.0% p.a. while the stock volatility is 0.2. Using Black Scholes Option Pricing Model, compute the call value.

$$C = S.N(d_1) - K e^{-rt} \cdot N(d_2)$$

$$d_1 = \frac{In\ (S/K) + [r + (\sigma^2/2)]\,T}{\sigma\sqrt{T}}$$

$$d_2 = d_1 - \sigma\sqrt{T}$$

(10 marks)

(b) Briefly describe the "Vega" and state the nature of relationships with call and put prices.

(6 marks)

(c) Briefly explain **ONE (1)** difference in risk taken by the buyer and the seller of an option.

(4 marks)

(d) Explain why margin is required when you sell options but not when you buy. Justify your answer.

(5 marks)

(Total: 25 marks)

Table: Cumulative Normal Distribution

d	N(d)	d	N(d)	d	N(d)	d	N(d)	d	N(d)	d	N(d)
−3.00	.0013	−1.58	.0571	−0.76	.2236	0.06	.5239	0.86	.8051	1.66	.9515
−2.95	.0016	−1.56	.0594	−0.74	.2297	0.08	.5319	0.88	.8106	1.68	.9535
−2.90	.0019	−1.54	.0618	−0.72	.2358	0.10	.5398	0.90	.8159	1.70	.9554
−2.85	.0022	−1.52	.0643	−0.70	.2420	0.12	.5478	0.92	.8212	1.72	.9573
−2.80	.0026	−1.50	.0668	−0.68	.2483	0.14	.5557	0.94	.8264	1.74	.9591
−2.75	.0030	−1.48	.0694	−0.66	.2546	0.16	.5636	0.96	.8315	1.76	.9608
−2.70	.0035	−1.46	.0721	−0.64	.2611	0.18	.5714	0.98	.8365	1.78	.9625
−2.65	.0040	−1.44	.0749	−0.62	.2676	0.20	.5793	1.00	.8414	1.80	.9641
−2.60	.0047	−1.42	.0778	−0.60	.2743	0.22	.5871	1.02	.8461	1.82	.9656
−2.55	.0054	−1.40	.0808	−0.58	.2810	0.24	.5948	1.04	.8508	1.84	.9671
−2.50	.0062	−1.38	.0838	−0.56	.2877	0.26	.6026	1.06	.8554	1.86	.9686
−2.45	.0071	−1.36	.0869	−0.54	.2946	0.28	.6103	1.08	.8599	1.88	.9699
−2.40	.0082	−1.34	.0901	−0.52	.3015	0.30	.6179	1.10	.8643	1.90	.9713
−2.35	.0094	−1.32	.0934	−0.50	.3085	0.32	.6255	1.12	.8686	1.92	.9726
−2.30	.0107	−1.30	.0968	−0.48	.3156	0.34	.6331	1.14	.8729	1.94	.9738
−2.25	.0122	−1.28	.1003	−0.46	.3228	0.36	.6406	1.16	.8770	1.96	.9750
−2.20	.0139	−1.26	.1038	−0.44	.3300	0.38	.6480	1.18	.8810	1.98	.9761
−2.15	.0158	−1.24	.1075	−0.42	.3373	0.40	.6554	1.20	.8849	2.00	.9772
−2.10	.0179	−1.22	.1112	−0.40	.3446	0.42	.6628	1.22	.8888	2.05	.9798
−2.05	.0202	−1.20	.1151	−0.38	.3520	0.44	.6700	1.24	.8925	2.10	.9821
−2.00	.0228	−1.18	.1190	−0.36	.3594	0.46	.6773	1.26	.8962	2.15	.9842
−1.98	.0239	−1.16	.1230	−0.34	.3669	0.48	.6844	1.28	.8997	2.20	.9861
−1.96	.0250	−1.14	.1271	−0.32	.3745	0.50	.6915	1.30	.9032	2.25	.9878
−1.94	.0262	−1.12	.1314	−0.30	.3821	0.52	.6985	1.32	.9066	2.30	.9893
−1.92	.0274	−1.10	.1357	−0.28	.3897	0.54	.7054	1.34	.9099	2.35	.9906
−1.90	.0287	−1.08	.1401	−0.26	.3974	0.56	.7123	1.36	.9131	2.40	.9918
−1.88	.0301	−1.06	.1446	−0.24	.4052	0.58	.7191	1.38	.9162	2.45	.9929
−1.86	.0314	−1.04	.1492	−0.22	.4129	0.60	.7258	1.40	.9192	2.50	.9938
−1.84	.0329	−1.02	.1539	−0.20	.4207	0.62	.7324	1.42	.9222	2.55	.9946
−1.82	.0344	−1.00	.1587	−0.18	.4286	0.64	.7389	1.44	.9251	2.60	.9953
−1.80	.0359	−0.98	.1635	−0.16	.4365	0.66	.7454	1.46	.9279	2.65	.9960
−1.78	.0375	−0.96	.1685	−0.14	.4443	0.68	.7518	1.48	.9306	2.70	.9965
−1.76	.0392	−0.94	.1736	−0.12	.4523	0.70	.7580	1.50	.9332	2.75	.9970
−1.74	.0409	−0.92	.1788	−0.10	.4602	0.72	.7642	1.52	.9357	2.80	.9974
−1.72	.0427	−0.90	.1841	−0.08	.4681	0.74	.7704	1.54	.9382	2.85	.9978
−1.70	.0446	−0.88	.1894	−0.06	.4761	0.76	.7764	1.56	.9406	2.90	.9981
−1.68	.0465	−0.86	.1949	−0.04	.4841	0.78	.7823	1.58	.9429	2.95	.9984
−1.66	.0485	−0.84	.2005	−0.02	.4920	0.80	.7882	1.60	.9452	3.00	.9986
−1.64	.0505	−0.82	.2061	0.00	.5000	0.82	.7939	1.62	.9474	3.05	.9989
−1.62	.0526	−0.80	.2119	0.02	.5080	0.84	.7996	1.64	.9495		
−1.60	.0548	−0.78	.2177	0.04	.5160						

This table shows the probability [N(d)] of observing a value less than or equal to d. For example, as illustrated, if d is −.24, then N(d) is .4052.

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